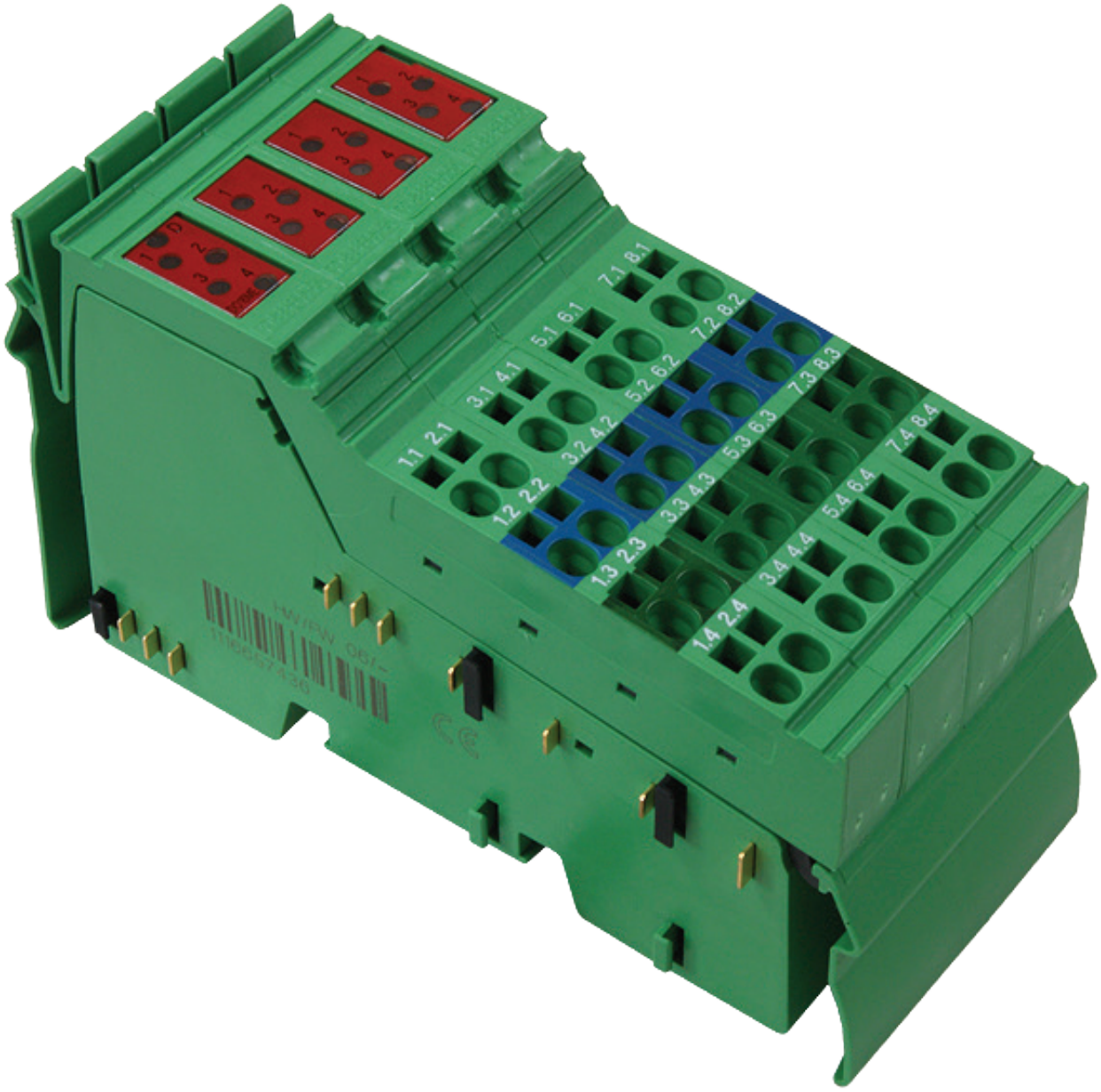
Inline terminal: 16 digital outputs
ILT 24 DO 16-ME

Device description



SysMik® GmbH Dresden

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We are grateful to you for criticism and suggestions. Further information (device description, available software) can be found on our homepage www.sysmik.de. Please ask for latest information.

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1 Description

Note: This device description is only valid in association with the IL SYS INST UM user manual. Make sure you always use the latest documentation – it can be downloaded at www.sysmik.de.

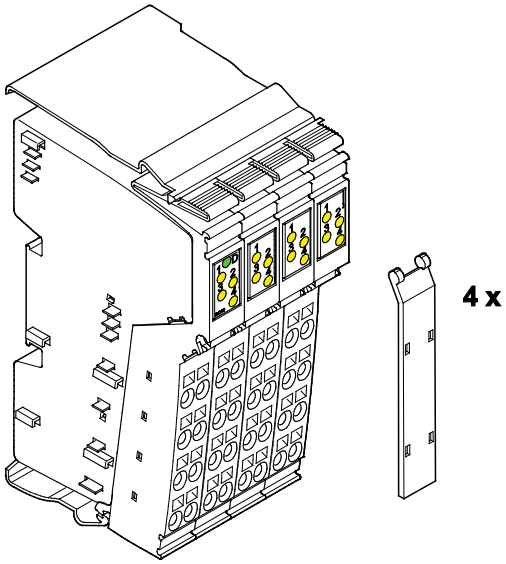


Bild 1: Inline-Klemme ILT 24 DO 16-ME

The terminal is designed for use within an -Inline station. It is used to -acquire digital output signals.

Features

- Connections for 16 digital actuators
- Connection of actuators in 2 and 3--wire technology
- Nominal current per output: 0.5 mA
- Total current of the terminal:- 8.0 A
- Short-circuit and overload protected -outputs
- Diagnostic and status indicators

2 Order information

Description	Type	Part number	Pcs./Pkt.
Terminal with four digital outputs; including connector and labeling field	ILT 24 DO 16-ME	1225-100516-01-8	1

3 Technical data

General Data	
Housing dimensions (width x height x depth)	48.8 mm x 120 mm x 71.5 mm
Weight	130 g (without connectors)
Operating mode	Process data mode with 1 word
Transmission speed	500 kBaud
Connection method for sensors	2 and 3-wire technology
Permissible temperature (operation)	-25 °C to +55 °C
Permissible temperature (storage/transport)	-25 °C to +85 °C
Permissible humidity (operation/storage/transport)	10 % to 95 %, accordnig to DIN EN 61131-2
Permissible air pressure (operation/storage/transport)	70 kPa to 106 kPa (up to 3000 m above sea level)
Degree of protection	IP20 according to IEC 60529
Protection class	Class 3 according to VDE 0106, IEC 60536

Interface	
Local bus	Via data routing
Current consumption from the local bus	90 mA maximum

Power Consumption	
Power consumption from the local bus	0.675 W maximum
Segment supply voltage U_S	24 V DC (nominal value)
Nominal current consumption at U_S	8 A (16 x 0.5 A) maximum

Supply of the Module Electronics and I/O Through Bus Terminal/Power Terminal	
Connection method	Through potential routing

Digital Outputs	
Number	16
Nominal output voltage U_{OUT}	24 V DC
Differential voltage for I_{nom}	≤1 V
Nominal current I_{nom} per channel	0.5 A
Tolerance of the nominal current	+10 %
Total current	8 A
Short circuit; overload	Short circuit; overload

Note: All four channels are thermally coupled, i.e.an error in one channel canaffect the other channels.

Nominal Load	
Ohmic	48 Ω / 12 W
Lamp	12 W
Inductive	12 VA (1,2 H, 50 Ω)
Signal delay upon power up of:	
- Ohmic nominal load	500 µs typical
- Lamp nominal load	typisch 100 ms typical (with switching frequencies up to 8 Hz; above this frequency the lamp load responds like an ohmic load)
- Inductive nominal load	100 ms (1.2 H, 50 Ω) typical

Signal delay upon power down of:	
- Ohmic nominal load	1 ms typical
- Lamp nominal load	1 ms typical
- Inductive nominal load	50 ms (1.2 H, 50 Ω) typical
Switching frequency with:	
- Ohmic nominal load	maximal 300 Hz

Note: This switching frequency is limited by the selected data rate, the number of devices, the bus structure, the software and the control or computer system used.

- Lamp nominal load	maximal 300 Hz

Note: This switching frequency is limited by the selected data rate, the number of devices, the bus structure, the software and the control or computer system used.

- Induktive nominal load	0,5 Hz (1.2 H, 50 Ω) maximum
Overload response	Auto restart
Response time with ohmic overload (12 W)	appr. 3 s
Restart frequency with ohmic overload	appr. 400 Hz
Restart frequency with lamp overload	appr. 400 Hz
Response with inductive overload	Output may be damaged
Response time in the event of a short circuit	appr. 3 s
Reverse voltage protection against short pulses	Protected against reverse voltages
Resistance to permanently applied reverse voltages	Protected against reverse voltages, permissible current 2 A maximum
Resistance to permanently applied surge voltage	no
Validity of output data after connecting the 24 V voltage supply (power up)	5 ms typical
Response upon power down	The output follows the supply voltage without delay
Limitation of the voltage induced on circuit interruption	$-15\ V \leq U_{demag} \leq -46\ V$ (U_{demag} = demagnetization voltage)

One-time unsolicited energy	400 mJ maximum
Protective circuit type	integrated 45 V-Zener diode in the output chip
Overcurrent shutdown	0,7 A minimum
Output current when switched off	300 µA maximum
Output voltage when switched off	2 V maximum
Output current with ground connection interrupt	25 mA maximum
Switching power with ground connection interrupt	100 mW at 1 kΩ load resistance, typical
Inrush current with lamp load	1.5 A for 20 ms maximum

Output Characteristic Curve When Switched On (Typical)	
Output Current (A)	**Differential -Output Voltage (V)**
0	0
0.1	0.04
0.2	0.08
0.3	0.12
0.4	0.16
0.5	0.20

Power Dissipation	
Formula to Calculate the Power Dissipation of the Electronics	$P_{EL} = 0{,}19\ W + \sum_{n=1}^{16} (0{,}10\ W + I_{Ln}^2 \times 0{,}4\ \Omega)$
Where: P_{TOT} = Total power dissipation in the terminal n = Index of the number of set outputs n = 1 to 16 I_{Ln} = Load current of output n	
Power dissipation of the housing P_{HOU}	2.7 W, maximum (within the permissible operating temperature)

Limitation of Simultaneity, Derating		
Ambient Temperature T_A	**Maximum Load Current at 100% Simultaneity**	**Maximum Load Current at 75% Simultaneity**
-25 °C ≤ T_A < +40 °C	0.50 A	0.50 A
+40 °C ≤ T_A < +45 °C	0.45 A	0.50 A
+45 °C ≤ T_A < +50 °C	0.40 A	0.50 A
+50 °C < T_A ≤ +55 °C	0.35 A	0.50 A

With 100% simultaneity, a load current of 0.4 A for each channel is permissible up to 50°C (ambient temperature range) and a load current of 0.35 A from 50°C and higher. If a maximum of twelve channels are used simultaneously in the entire ambient temperature range (75% simultaneity, maximum) a load current of 0.5 A can be tapped.

Safety Equipment	
Overload/short circuit in segment circuit	Electronic; with 4-channel driver
Surge voltage	Protective elements in the power terminal; protection up to 33 V DC
Polarity reversal of the supply voltage	Protective elements in the power terminal; The supply voltage must be protected. The power supply unit should be able to supply 4 times (400 %) the -nominal current of the fuse.
Reverse voltage	Integrated reverse voltage protection

Electrical Isolation/Isolation of the Voltage Areas

To provide electrical isolation between the logic level and the I/O area, it is necessary to supply the station bus terminal and the digital output terminal described here using the bus terminal or a power terminal from separate power supply units. Interconnection of the power supply units in the 24 V area is not permitted. (See also user manual.)

Common Potentials

The 24 V main voltage, 24 V segment voltage, and GND have the same potential. FE is a separate potential area.

Separate Potentials in the System Consisting of Bus Terminal Module/Power Terminal and I/O Terminal

- Test Distance	- Test Voltage
5 V supply outgoing remote bus / 7.5 V supply (bus logic)	500 V AC, 50 Hz, 1 min.
5 V supply outgoing remote bus / 7.5 V supply (bus logic)	500 V AC, 50 Hz, 1 min.
7.5 V supply (bus logic) / 24 V supply (I/O)	500 V AC, 50 Hz, 1 min.
24 V supply (I/O) / functional earth ground	500 V AC, 50 Hz, 1 min.

Error Messages to the Higher-Level Control or Computer System

Short circuit/overload of an output	yes

An error message is generated when an output is short circuited and switched on. In addition, the diagnostic LED (D) flashes on the terminal at 2 Hz (medium) under these conditions.

Falling below or exceeding the operating voltage	no

4 Local diagnostic and status indicators and terminal point assignment

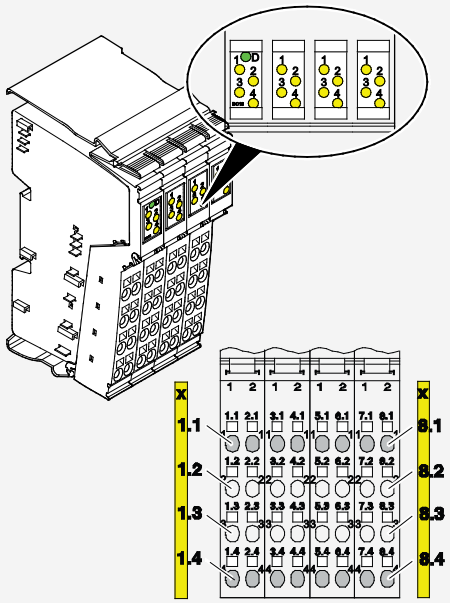


Fig. 2: local diagnostic and status indicators / Terminal point assignment

Designation	Color	Meaning
D	green	Diagnostics
1, 2, 3, 4 (for each connector)	Yellow	Status indicators of the outputs
Funktion identification		Red
Housing / connector color		Green housing, green connectors – coded according to function
Terminal assignment per connector:		
Terminal point		**Assignment**
x.1		Signal output (OUT)
x.2		Ground contact (GND) for 2 and 3-wire termination
x.3		FE connection for 3-wire termination
x.4		Signal output (OUT)

5 Internal circuit

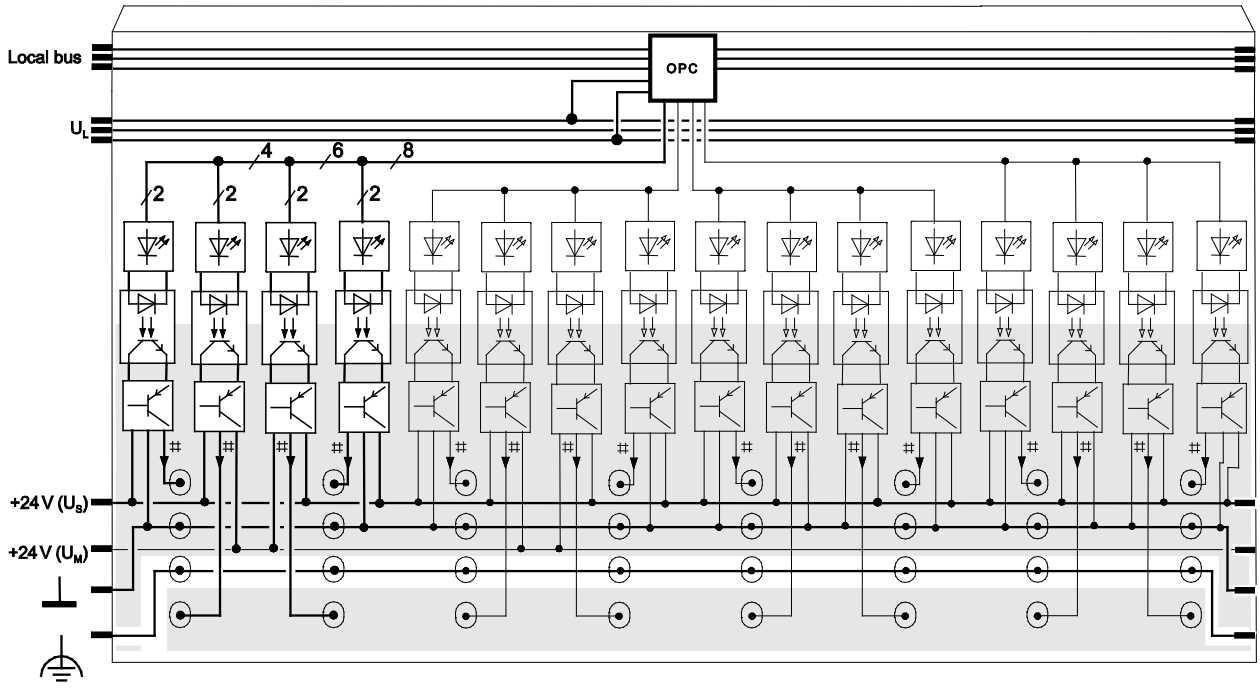
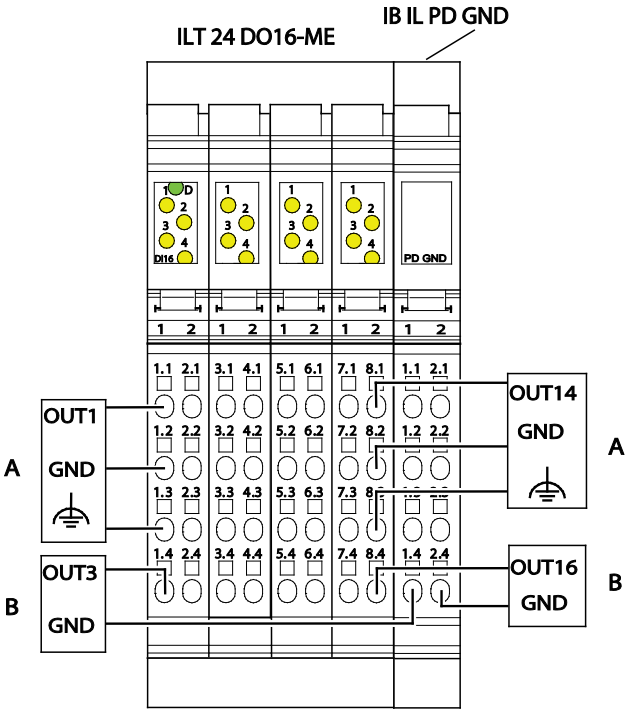


Fig. 3: Internal wiring of the terminal points

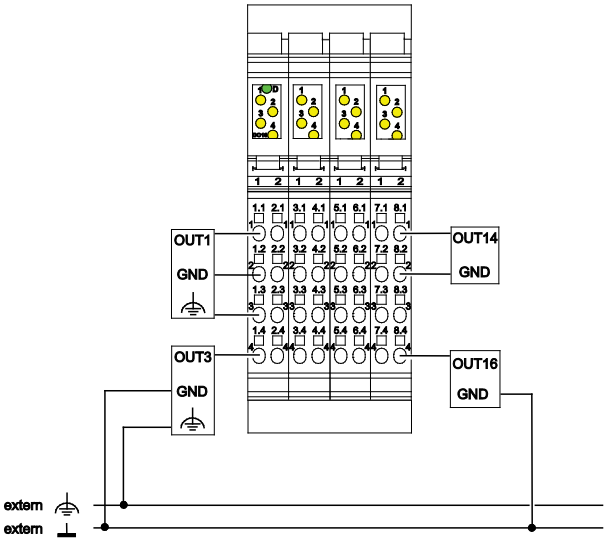
OPC	Protocol chip (bus logic including voltage conditioning)		Digital output
	LED		Electrically isolated area
	Optocoupler		

Note: Other symbols are explained in the user manual IL SYS INST UM or in the manual of your used bus system.

6 Connection notes and examples



The actuators can also be connected via external busbars. -Ensure that the actuators and U_S are supplied from the same voltage- supply



A 3-wire connection

B 2-wire connection

Note: When connecting the sensors, observe the assignment of the terminal points to the process data (see Terminal Point Assignment).

Note: Ensure that the Inline system ground is reference for at least the ground when using external busbars.

Fig. 4: Typical actuator connection

Fig. 5: Typical connection of sensors when using external busbars